

About the Draft Rhode Island K-12 Alternate Grade Span Expectations in Science

The document, the *Draft Rhode Island K-12 Alternate Grade Span Expectations in Science*, has been developed as a means to identify the science concepts and skills expected of all students participating in the RIAA; however, these AGSEs can be used for instruction in any classroom. The draft RI science GSEs encompass the content eligible for inclusion on RIAA of science in grades 4, 8, and 11. They are not intended to represent the full science curriculum at each grade span, but are meant to capture the “major ideas” of science that can be assessed in a state assessment. The goal is that the science GSEs focuses the curriculum, but do not restrict it.

The draft science AGSEs are written for grade spans K-4, 5-8, and high school. They describe the science knowledge and abilities students should demonstrate at the end of each grade span. The draft RI science AGSEs are extracted from the assessment targets developed as part of the framework for the common science assessment conducted in New Hampshire, Vermont and Rhode Island and the *Draft Rhode Island K-12 Grade Span Expectations in Science*.

As you review the *Draft Rhode Island K-12 Alternate Grade Span Expectations in Science*, the following information is important to understand, particularly the relationship between the science GSEs and the science assessment targets.

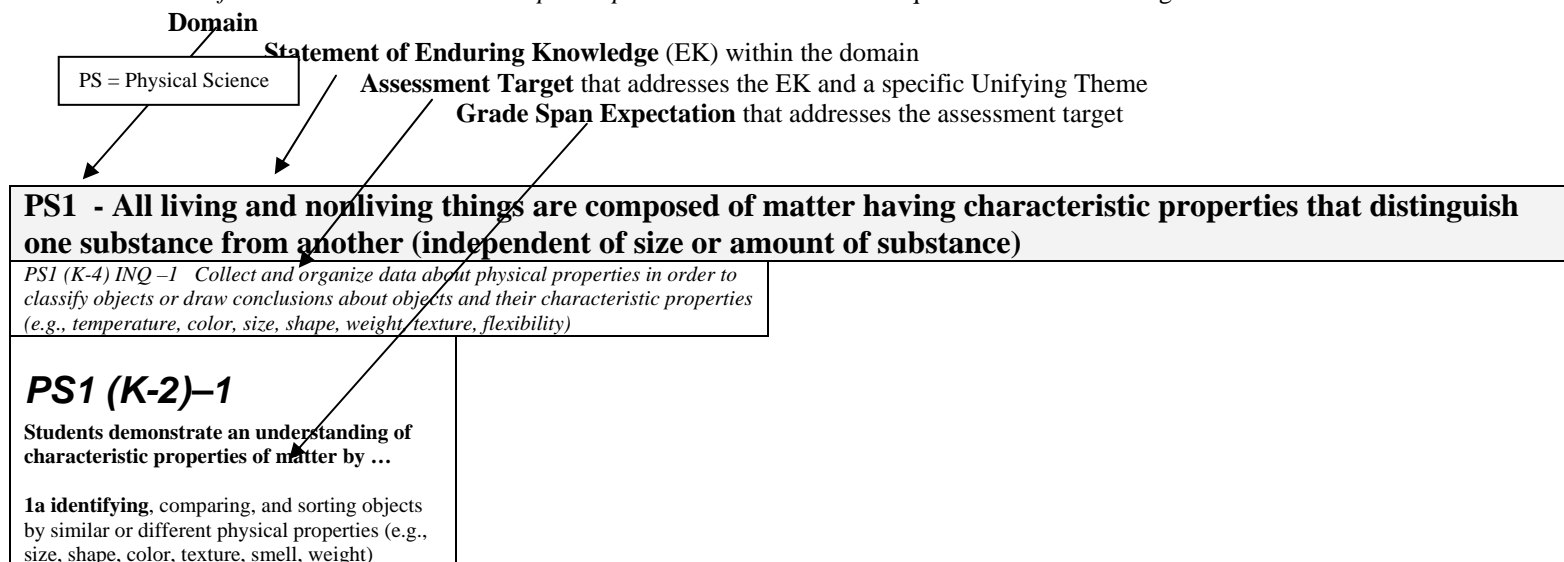
The draft science AGSEs are organized into three **domains; Life Science, Earth and Space Science; and Physical Science.**

1. The three domains are further subdivided into ten **Statements of Enduring Knowledge (EK)** (listed in Table 1) that
 - a. are intended to identify the fundamental knowledge/concepts for each domain of science.
 - b. cut across grade levels, so that learning is developmental/built upon across grades (although not all aspects of the EK may be addressed at all grade levels)
 - c. are of comparable grain size?
 - d. encompass, as a set, the *essential learning for each domain of science*
 - e. imply topics of study (and therefore, lead to focused instruction, as identified in science standards/benchmarks/GSEs)
2. Each **Assessment Target** is linked to one Statement of Enduring Knowledge, as indicated with the target’s coding (e.g., LS1 means Life Science and the first EK statement, LS2 means Life Science and the second EK, etc.)
3. Each Assessment Target incorporates one or more **Unifying Themes**, the broader universal principles that integrate the different scientific disciplines. Six Unifying Themes of Science were chosen after an extensive review of the literature and are further described in Table 2.
4. Assessment Targets for high school, middle school, and elementary school were developed by applying the Unifying Themes of science to the Statements of Enduring Knowledge for each of the science domains of Life Science, Earth and Space Science, and Physical Science. **Not every Unifying Theme has an “intersection” with every** Statement of Enduring Knowledge. Development committees used prioritization strategies and field reviews to determine which assessment targets would provide the richest opportunities for large-scale assessment purposes.

TABLE 1	
Statements of Enduring Knowledge (EK) by Domain	
Life Science	LS 1 All living organisms have identifiable structures and characteristics that allow for survival (organisms, populations, and species).
	LS 2 Matter cycles and energy flows through an ecosystem.
	LS 3 Groups of organisms show evidence of change over time (structures, behaviors, and biochemistry).
	LS 4 Humans are similar to other species in many ways, and yet are unique among Earth's life forms.
Earth & Space Science	ESS 1 The Earth and earth materials as we know them today have developed over long periods of time, through continual change processes.
	ESS 2 The earth is part of a solar system, made up of distinct parts that have temporal and spatial interrelationships.
	ESS 3 The origin and evolution of galaxies and the universe demonstrate fundamental principles of physical science across vast distances and time
Physical Science	PS 1 All living and nonliving things are composed of matter having characteristic properties that distinguish one substance from another (<i>independent of size or amount of substance</i>)
	PS 2 Energy is necessary for change to occur in matter. Energy can be stored, transferred and transformed, but cannot be destroyed.
	PS 3 The motion of an object is affected by forces.

Unifying Themes of Science (Subheadings under each Unifying Theme/Big Idea suggest but are not limited to what might be addressed)					
Scientific Inquiry	Nature of Science	Systems & Energy	Models & Scale	Patterns of Change	Form & Function
<ul style="list-style-type: none"> • Collect data • Communicate understanding & ideas • Design, conduct, & critique investigations • Represent, analyze, & interpret data • Experimental design • Observe • Predict • Question and hypothesize • Use evidence to draw conclusions • Use tools, & techniques 	<ul style="list-style-type: none"> • Accumulation of science knowledge (evidence & reasoning, looking at work of others) • Attitudes and dispositions of science (avoiding bias, divergent ideas, healthy skepticism) • History of Science • Science/Tech/ Society • Scientific Theories 	<ul style="list-style-type: none"> • Cycles • Energy Transfer • Equilibrium • Interactions • Interdependence • Order & Organization 	<ul style="list-style-type: none"> • Evidence provided through... • Explanations provided through... • Relative distance • Relative sizes <p><i>Models include - experimental models, simulations, & representations used to demonstrate abstract ideas</i></p>	<ul style="list-style-type: none"> • Constancy and Change • Cycles • Evolutionary Change 	<ul style="list-style-type: none"> • Natural World

5. The *Draft Rhode Island K-12 Grade Span Expectations in Science* are sequenced in the following manner:



6. Each Assessment Target contains a code before the narrative text of the target. These codes identify the specific Statement of Enduring Knowledge, the grade span, the connections to one or more Unifying Theme/Big Idea, and finally the target number. Table 3 illustrates an example: **LS1 (K-4) INQ+POC -1** means that this target addresses the first Life Science EK statement (**LS1**); the **(K-4)** grade span; is linked to Unifying Themes/Big Ideas of Inquiry (**INQ**) and Patterns of Change (**POC**); and is the first assessment target listed (**1**) under the domain of Life Science. Some targets address only one Unifying Theme and others address more than one. For a more detailed explanation see *READING A SCIENCE GSE* found on page 6 of this document

Table 3 Sample Target Coding		
LS1 – All living organisms have identifiable structures and characteristics that allow for survival (organisms, populations, and species)		
Elementary Target	Middle School Target	High School Target
LS1 (K-4) INQ+POC -1 Sort/classify different living things using similar and different characteristics. Describe why organisms belong to each group or cite evidence about how they are alike or not alike.	LS1 (5-8) – INQ+ SAE- 1 Using data and observations about the biodiversity of an ecosystem make predictions or draw conclusions about how the diversity contributes to the stability of the ecosystem.	LS1 (9-11) INQ+SAE+FAF -1 Use data and observation to make connections between, to explain, or to justify how specific cell organelles produce/regulate what the cell needs or what a unicellular or multi-cellular organism needs for survival (e.g., protein synthesis, DNA replication, nerve cells)

